APPENDIX D: ENVIRONMENT

EXISTING CONDITIONS

AIR QUALITY

In general the existing air quality in York County is good and is expected to remain so during the period covered by this plan. York County's two major sources of air emissions are Amoco's Yorktown Refinery and Virginia Electric Power Company's Yorktown Generating Station. There are also four federal government facilities that are classified as minor sources.

The regulation of air quality in the County is accomplished through the implementation of the provisions of the federal Clean Air Act as revised in 1990. This legislation and any future revisions are reflected in regulations promulgated by the federal Environmental Protection Agency (EPA) which in turn are enforced by the Commonwealth of Virginia's Department of Environmental Quality through the State Implementation Plan (SIP). In this process National Ambient Air Quality Standards (NAAQSs) are enforced through permits for certain stationary sources and by other regulations effecting the operation and maintenance of certain mobile sources.

York County is part of the Hampton Roads Air Quality Region which is presently in compliance with all applicable NAAQSs. Until recently this region was listed as a marginal non-attainment area for ozone (smog) but the EPA, after being petitioned by the Commonwealth and with the availability of new data, recently reclassified the region as an attainment area. As a result of this action, York County can consider any industrial or commercial growth as long as proposed facilities meet the new source performance standards and the emissions would not cause a violation of the existing NAAQSs. However, it is possible that raising the standards by the EPA could result in more severe future emissions control limits on existing sources, prohibition of new sources of emissions and/or programmatic controls to reduce mobile emission sources.

Climate

The climate of the Virginia Peninsula is mild with average January temperatures of 42^{o}F and July average temperatures of 79^{o}F. The growing season is 190 days long and the annual rainfall averages about forty-five inches and does not vary significantly from month to month.

LAND

Topography

The topography of land in York County varies from generally low, flat land with high water tables in the lower County to rolling terrain with well-drained soils in the northern reaches at elevations of approximately 100 feet. The Steep Slopes map shows those areas in the County with slopes greater than 15%, which are subject to potential erosion and special Zoning Ordinance regulations to ensure the integrity of these slopes.

Soils

There are six main soil categories in the County as defined by the Virginia Soils Conservation Service. The different soils types dictate limitations on construction techniques required for successful development in each area. A significant issue that has surfaced in the past several years has been testing and construction requirements associated with shrink-swell soils. To date there have been no major problems in York County but both James City and Chesterfield Counties have experienced major shrink-swell issues.

The County contains soils types that are conducive to agriculture use, but, for economic reasons, farming of land is often an interim use until the land can be developed for more profitable uses. The County's land

use taxation program provides tax relief for much of this type of property, including qualifying lands dedicated to agricultural or horticultural use.

A significant portion of the County has a high water table, defined as being within 2.5 feet of the ground elevation. In addition, much of this high water land has been classified as hydric and remains saturated for enough time during the growing season to develop anaerobic conditions. This characteristic is significant in making wetland determinations.

The suitability of soils for supporting a properly functioning septic system is dependent on such factors as slope, susceptibility to severe wetness, flooding potential, percolation (permeability) rate, and filtering characteristics. With few exceptions, the entire County is generally characterized by soils with severe limitations for septic systems. (A map of these areas can be found in a separate report, Charting the Course for the Chesapeake Bay.) There are system failures reported by the Health Department in various areas of the County; however, they should not be construed as an absolute indication that septic systems will not function properly in a particular area. For site-specific conditions, on-site surveys and samples must be obtained. The combined characteristics of a high water table, slope, permeability, and flood potential make the proper functioning of septic tanks difficult in the lower County. Periodically the Health Department conducts a "shoreline sanitary survey" of the County (discussed in more detail below) and, where on-site deficiencies are identified, the property owner is notified of the violation. Follow-up inspections are conducted by the local Health Department to ensure that corrections are made to the system.

Erosion and Sedimentation Control

Adequate erosion control measures will minimize site sediment runoff and, as these sediments also tie up phosphorus and nitrogen, such control results in the reduction of nutrients to the receiving waters. The current Erosion and Sediment Control Ordinance which was adopted in 1991 requires that all land disturbances greater than 2500 square feet, including single family home construction must meet County standards relative to the installation of control systems such as silt fences, straw bales, and check dams to control soil loss. The erosion and sediment control ordinance is currently being updated for compliance with the latest State model ordinance.

The Colonial Soil and Water Conservation District provides assistance to Peninsula localities on the conservation of soil, water and related natural resources. The District staff also works with the agricultural community in preparing conservation plans and advising farmers on proper land management.

In 1990, the County and the District formalized this working relationship with a Memorandum of Understanding. Included as part of the agreement are provisions for the Soil Conservation District to perform the following services:

- Assist the County with erosion and sediment control programs;
- Provide education on natural resource conservation; and
- Assist in developing ordinances, policies, and plans for managing soil, water, and natural resources.

A member of the York County Board of Supervisors is appointed as a liaison representative to the District to ensure joint coordination of soil conservation efforts.

WATER QUALITY

Water quality is a critical issue to every community but particularly so for York County because of its location and topography. Not only is water an important resource in terms of providing drinking water, it also provides important recreational, aesthetic, and economic benefits to the County and its citizens. The regulation of surface and ground water involves a significant number of federal, state, and local programs. These regulations are directed mainly at three targets: point sources such as end-of-pipe discharges and underground storage tanks, nonpoint sources such as stormwater runoff, and nontidal and tidal wetlands.

All of these sources together contribute to the level of water quality in the Chesapeake Bay, the York River, and all of their tributaries.

York County, for the most part, enjoys high-quality water in both its fresh water and brackish water systems. The protection of water systems in Virginia is the responsibility of the State Water Control Board and its regulatory agency the Department of Environmental Quality and to some extent the State Board of Health. Some specific issues relating to these systems are discussed below. More detailed technical information about water quality, shoreline and streambank erosion, and waterfront access can be found in a separate companion report entitled Charting the Course for the Chesapeake Bay, prepared in 2001 by County Environmental and Development Services Department and Planning Division staff.

Fresh Surface Water

The major source of drinking water in York County is surface water impoundments, all of them owned by other jurisdictions. The five surface water impoundments used as reservoirs for drinking water are located completely or partially in the County are listed below:

- Lee Hall Reservoir (owned and operated by the City of Newport News)
- Harwoods Mill Reservoir (owned and operated by the City of Newport News)
- Waller Mill Reservoir (owned and operated by the City of Williamsburg)
- Big Bethel Reservoir (owned and operated by the Federal Government for Langley Air Force Base)
- Jones Pond (owned and operated by the Federal Government for Cheatham Annex)

Because the quality of surface water is directly related to land use, York County amended its zoning ordinance by creating a Watershed Management and Protection Area (WMP) overlay district in 1985. The intent of the regulations of the WMP overlay district is to ensure the protection of watersheds surrounding current and potential public water supply reservoirs. The regulations prevent the degradation of reservoirs from the operation or accidental malfunctioning of the use of land or its appurtenances within the drainage area of water sources.

The WMP provisions that apply to these areas require that a 200-foot vegetated buffer be maintained from the edge of any reservoir or tributary stream. They also prohibit certain uses, such as feed lots, septic drainfields, and landfills, within 700 feet of reservoirs and their associated tributary streams. Storage of hazardous wastes is specifically prohibited throughout the district. In addition to limiting land use, the regulations require an impact study addressing water quality to ensure that post-development runoff does not exceed pre-development rates or quality.

The water quality in all of these reservoirs is high with the exception of the Big Bethel Reservoir, where urbanization and development have diminished the water quality. The federal government has recently constructed a new water treatment facility at Big Bethel to provide high-quality potable water through treatment.

Ground Water

Ground water is directly related to surface water and is itself an important drinking water source. It is contained in the saturated pore spaces of sediments beneath the surface of the Earth. The underwater formations that yield water to wells are called *aquifers*. They store, disperse, and transmit water. Groundwater is replenished by precipitation on the land surface or downward seepage of water through overlying beds. The amount of water in an aquifer contains depends on two features –porosity and permeability of the surrounding soils.

Porosity refers to the amount of open space (voids) between the sands, silt, and gravel. Permeability is the ability of the soil to transmit water through the aquifer material. Sandy and gravelly soils can hold large amounts of water because there are larger and more connected spaces between the particles. Clay soils, on the other hand, have small spaces that are not connected, making water passage difficult. Annual recharge to the groundwater system from precipitation is approximately ten inches per year in the York County area.

The ground water flow system in the Coastal Plain is a multi-aquifer system generally flowing from west to east. Studies have identified at least seven major aquifers – three shallow and four deep – in York County. Generally, the oldest aquifers are the deepest.

In general, there are six hydrogeologic units comprising the shallow aquifer system, three aquifers and three confining layers. The Columbia aquifer is the County's uppermost and is unconfined, its upper limit being the seasonally variable water table and its depth being at least five feet (5'). It is not the aquifer of choice for potable water because of its relatively low yields, poor water quality, and its susceptibility to contamination. There are some very shallow wells in the County (nine feet) still being used for potable water in older neighborhoods.

Of the deep aquifers, the Chickahominy-Piney Point aquifer, characterized by black and white sands interspersed with shells and dark, silty clay, is important to York County in that it is used by the five wells for public water distribution. This aquifer is also used by industry in West Point and Franklin and lies approximately 150 to 400 feet below mean sea level. Below this aquifer is the Aquia Aquifer, which is not utilized much in eastern Virginia because the deposits are fine-grained and commonly contain a limy mud matrix and thin limestone beds. Deeper still is the Upper Potomac Aquifer, capable of producing large quantities of good water suitable for most uses. The two lowest aquifers, the Middle and Lower Potomac, also are capable of supplying large quantities of water but are generally too deep for all but major industrial and municipal applications.

The Virginia Department of Environmental Quality has designated York County as part of a ground water management area and major withdrawals (more than 10,000 GPD) require approval by the State Water Control Board (SWCB). The SWCB has authorized the withdrawal of 24.9 million gallons per year (68,219 GPD or 0.069 MGD) from the three wells comprising the Skimino Hills/Banbury Cross system. The depths of these wells, which are pumping an average of almost 57,000 GPD, range from 283 to 324 feet. The two wells that make up the Lightfoot system are authorized to withdraw 204.4 million gallons per year (560,000 GPD or 0.56 MGD). These wells are pumping an average of 30,567 GPD and are 310 and 318 feet deep.

The overall natural quality of the groundwater in Hampton Roads is high. Large-scale human-induced contamination of the region's aquifers is not a problem. There are seven major threats to groundwater quality, including inefficient septic systems; leaky underground storage tanks; spills and improper disposal of hazardous material; leaky surface water impoundments; leaky landfills; improper pesticide and fertilizer application; and pumping induced saltwater encroachment. The most vulnerable aquifer in the County is the Columbia since it is shallow and unconfined. Deeper aquifers can be contaminated from downward migration, and the health and economic impacts on a community can be high. It is imperative, therefore, that groundwater be protected.

In compliance with the Safe Drinking Water Act, York County is required to test for over one hundred contaminants and produce an annual Consumer Confidence Report to document the quality of the drinking water distributed to customers via the County's distribution systems in the Skimino Hills, Banbury Cross, and Hubbard Lane areas. Testing conducted in 1998 detected only four contaminants (copper, fluoride, gross alpha, and gross beta), all of which were well within permissible ranges.

In addition, the Virginia Department of Health monitors wells and water supply systems serving 15 or more connections and systems serving more then 25 persons for more than 60 days of the year. Community wells and systems have quarterly testing and reporting requirements. Local Health Departments monitor non-community and non-transient wells. They also process the permits for private wells and administer the State's Private Well Regulations, which are intended to ensure that private wells are located, constructed, and operated in a manner that does not adversely affect public safety, health, or groundwater resources. The local Health Departments do not monitor, inspect or track abandoned wells. Because improperly abandoned wells are a possible point of aquifer contamination, York County has an interest in assisting the Health Department to establish a database of abandoned wells and insuring their proper closure. According to both the Williamsburg and Newport News offices of the Health Department, there have been no reports or complaints of saltwater intrusion into private wells in York County.

In 1999, the EPA required all state health departments to assess wells within their jurisdiction to identify aquifer contamination from surface runoff. The well serving the Captain John Smith Lodge on Richmond Road had experienced some poor test results and was therefore tested by the local Health Department for the required duration. It was determined that the well was not contaminating the aquifer via surface runoff.

Groundwater consumption in York County via the public distribution system will likely increase over time. The Skimino wells are pumping at 83% of their capacity, but the Lightfoot wells are at only 0.5% of capacity. When these two systems are connected, additional connections will be permitted in the Banbury Cross and Old Quaker Estates area. As commercial Lightfoot consumers are added to the system, it will be necessary to augment the system with additional water. Ultimately the County plans to turn these groundwater-based distribution systems over to Newport News Waterworks.

According to the 1990 Census, 1,541 households in the County obtained water from private drilled wells in 1990 and 271 households obtained water from dug wells. Cumulatively, it is estimated that these homes on private wells consume an average of 380,000 GPD.

Although public water hook-up in the County is not mandatory, the number of private wells used for potable water is decreasing. All *new* construction must use public water if it is available, and as capital improvement projects continue to bring public water to existing neighborhoods, more residents are abandoning private wells in favor of the public water system. Neighboring localities have adopted ordinances requiring existing residences to connect to the public water system in the event of private well failure.

Most of the groundwater in the County distributed for drinking water comes from the Chickahominy-Piney Point aquifer, which is a confined aquifer. The confining units between the aquifers limit the movement of pollutants into the water supply, hence the majority of groundwater from wells in the County is afforded a significant level of protection from contamination. However, an unknown number of private wells in the County are withdrawing water from the unconfined surficial aquifers. Because of the lack of confining units, pollutants from the land's surface, underground storage tanks, or sanitary septic drainfields can move freely into the groundwater.

There are six landfills in the County, three of them active and three closed. The Virginia Department of Environmental Quality regulates landfills to prevent contaminants from leaching into groundwater.

Military installations in the County have documented soil and groundwater contamination problems. Cheatham Annex contains a defunct fuel farm and soils that are contaminated with fuel and solvents. The Naval Weapons Station contains a Superfund site which, according to the EPA, has been contaminated with polychlorinated biphenyls (PCBs), explosives, contaminated wastewater, organic solvents, and other material involved in the testing and manufacture of explosives. There is no evidence of contaminated groundwater leaving either facility. York County will continue to monitor these situations as federal studies of the problems continue.

There are currently seventeen open cases of leaking underground storage tanks in the County that are being monitored and regulated by the DEQ through the LUST (Leaking Underground Storage Tank) program. Six of these cases are located at the BP-Amoco refinery and four on local military bases. Although inclusion in this list does not necessarily mean there is an active leak, it does mean that steps required to clean up the site are underway.

The Department of Health routinely conducts Shoreline Sanitary Surveys to identify and evaluate sources of pollution that have the potential to contaminate shellfish. The focus is on surface water pollution, but some of the information is also pertinent to an evaluation of groundwater conditions, especially relating to shallow unconfined aquifers. One such survey identified ten houses in the Skimino Hills subdivision that have defective septic systems. Several other homes in this neighborhood are identified as having potential pollution problems. It should be noted that many of the septic tank problems noted by the Health Department either have already been remedied or will be remedied by the year 2005. In 1999, the County received a grant from the Chesapeake Bay Local Assistance Department to map existing septic tanks and initiate a program for septic tank pump-out. Beginning in the year 2000, septic tank owners were notified

of the need for pump-out every five years and were required to begin a five-year regular pump-out maintenance program. This program will assist in the proper functioning of on-site sewer systems and thus protect the groundwater and surface water. In addition, the County's ongoing program to extend sanitary sewer to low-lying areas is based on a priority system driven by environmental and public health needs. Connection to public sanitary sewer in the County is mandatory.

An item of note is that the deeper aquifers have been dropping an average of two feet per year for at least the past twenty-five years. This drop is due primarily to increased production from large ground water users such as the paper mill in West Point and food processing plants on the southwest side of the James River. Many of the homes in the upper County utilize the aquifers and are of an age when this ongoing draw-down is beginning to affect the performance of their wells such that many will require replacement or lowering of the screen areas.

York County has three production wells that serve the Skimino/Banbury Cross residential communities in the upper County and has recently installed two additional production wells to service the Lightfoot Corridor for future commercial and light industrial development. The installation of the Lightfoot wells was approved by the SWCB and a minimal one-time draw-down of the water table with the wells at approved production was indicated by computer modeling.

The Hampton Roads Planning District Commission (HRPDC) in cooperation with its Utilities Directors Committee has a comprehensive mitigation program that will fund remediation work that may be necessitated by the installation of water supply wells by member jurisdictions; however, to date, no such issues have surfaced in York County.

Brackish Water

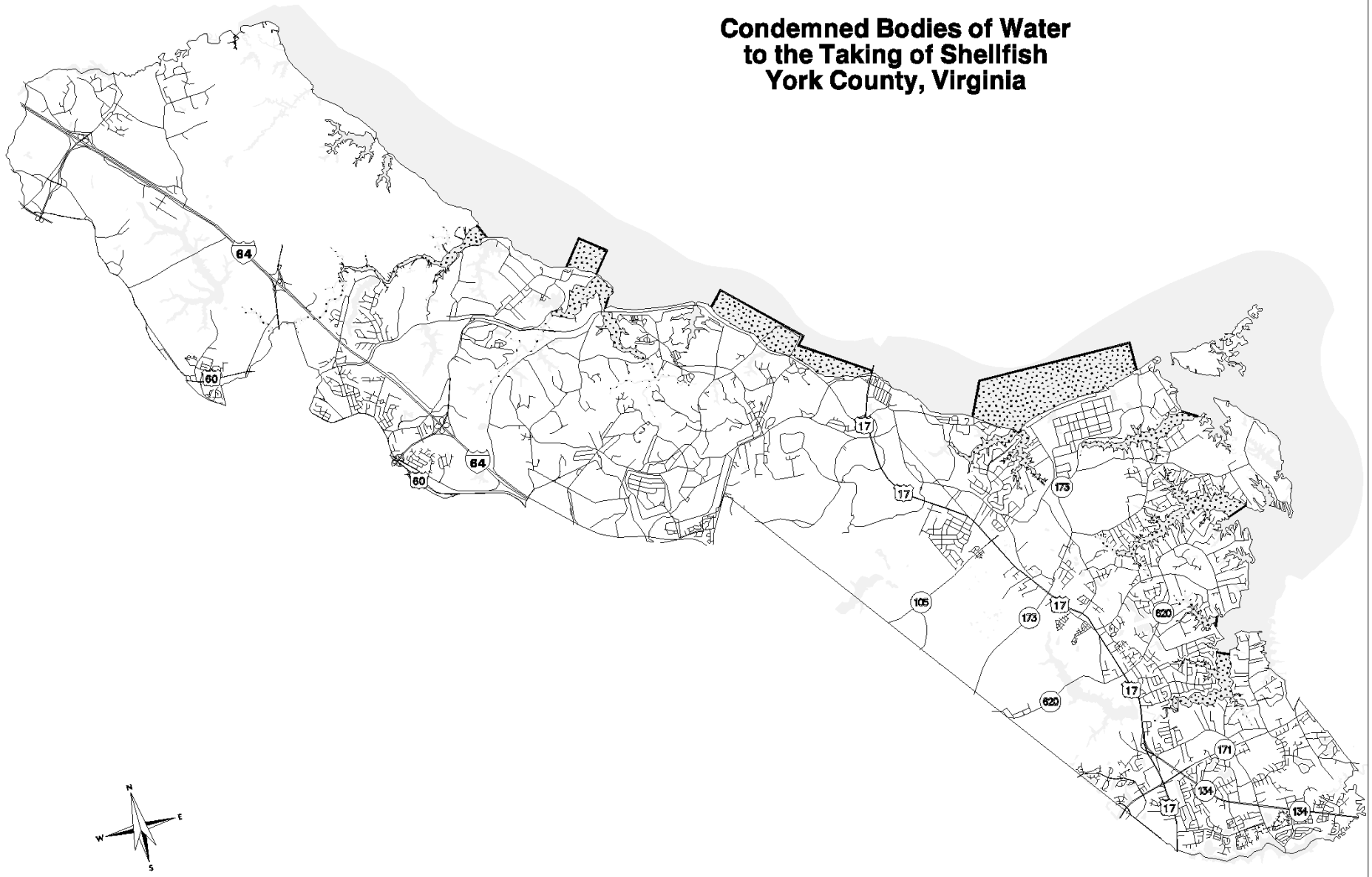
The water quality of the York River and its estuaries located in York County is acceptable for full body contact. According to the Virginia Marine Resources Commission, all of the tidal areas in the County are eligible for shellfish cultivation and growth. However, the following streams and surface water areas have been closed to direct marketing of shellfish by the Virginia Department of Health, Bureau of Shellfish Sanitation, because of high coliform bacteria counts or as a precautionary closure zone around point source discharges such as the power plant outfall:

- Wormley Creek
- Skimino Creek
- Carter Creek
- Queen Creek
- Patricks Creek
- Lambs Creek
- Poquoson River
- Chisman Creek
- Back Creek
- Felgates Creek
- Indian Field Creek
- King Creek
- York River at Cheatham Annex Sewage Treatment Plant discharge and between Sandy Point and Yorktown

The shellfish harvested in these closed areas must be relayed to warm clean water for at least two weeks prior to marketing.

Although shellfish information is available from the VMRC, fish habitat information is not. York County is home to many commercial and recreational fisheries that contribute to the local economy. Skimino Creek, which has been stressed very little by the effects of human activities, is a valuable nursery ground for white perch and striped bass. Queen Creek Marsh, which is the largest marsh creek wetland system in the County, is regarded as a major fish nursery and will remain so as long as disturbance is minimized. King and Felgate's Creeks are considered nursery areas for striped bass, white perch, and other species as are the fringing marshes of Indian Creek. Many of these creeks are located at least partly on military

Condemned Bodies of Water to the Taking of Shellfish York County, Virginia



Source: Areas were estimated from a map containing areas delineated by the Department of Health, Division of Shellfish Sanitation, dated January 1991.

March 12, 2001

Prepared by York County Computer Support Services

installations. Remaining lands adjacent to these creeks that are subject to development must observe water quality requirements for stormwater runoff and the vegetated buffer requirements of the Chesapeake Bay Preservation Act. Studies also have shown that fish populations that spawn in freshwater creeks and migrate to the ocean are very susceptible to the effects of urbanization, such as flow changes and pollution. Therefore, proper attention should be given to upland and waterfront development in these areas. Requests for dredging or filling in the wetlands and waterways adjacent to these nursery areas should be discouraged.

According to VIMS, there are submerged aquatic vegetation (SAV) beds in certain sections of the York River in York County. Approximately 15,000 acres along the York and Poquoson Rivers were included in the Chesapeake Bay Program's Tier I SAV target restoration area. The Tier I target is to restore SAV to areas currently or previously inhabited by SAV. The Tier III target includes restoration of SAV to all shallow water areas delineated as existing and potential SAV habitat.

York County recognizes SAV beds as critical living resources. Certain types of land activities can contribute excessive pollutants into adjacent waterways, degrade water quality, and thus impact SAV habitats. The intensity of land use and the density of piers can increase or restrict boat traffic along waterways with SAV. Shoreline erosion control structures can also affect SAV beds.

In 1972 the U.S. Congress passed the Federal Water Pollution Control Act. The goal of this act, which later became the Clean Water Act, is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." To achieve this goal, the Act considered only point source discharges, which are regulated through Virginia Pollution Discharge Elimination System (VPDES) permits issued by the State Water Control Board. The Clean Water Act prohibits the discharge of a pollutant into State waters without a VPDES permit. Issuance of a permit requires that industries use the "best available control technology" in order to comply with water quality standards.

In York County, VPDES permits have been issued to the following industrial and municipal dischargers for point source discharges to the York River:

- BP Amoco
- Dominion Virginia Power – Yorktown
- Cheatham Annex
- Williamsburg Water Filtration Plant
- HRSD York River – Sewage Treatment Plant
- U.S. Naval Weapons Station – Yorktown
- Harwoods Mill Water Treatment Plant

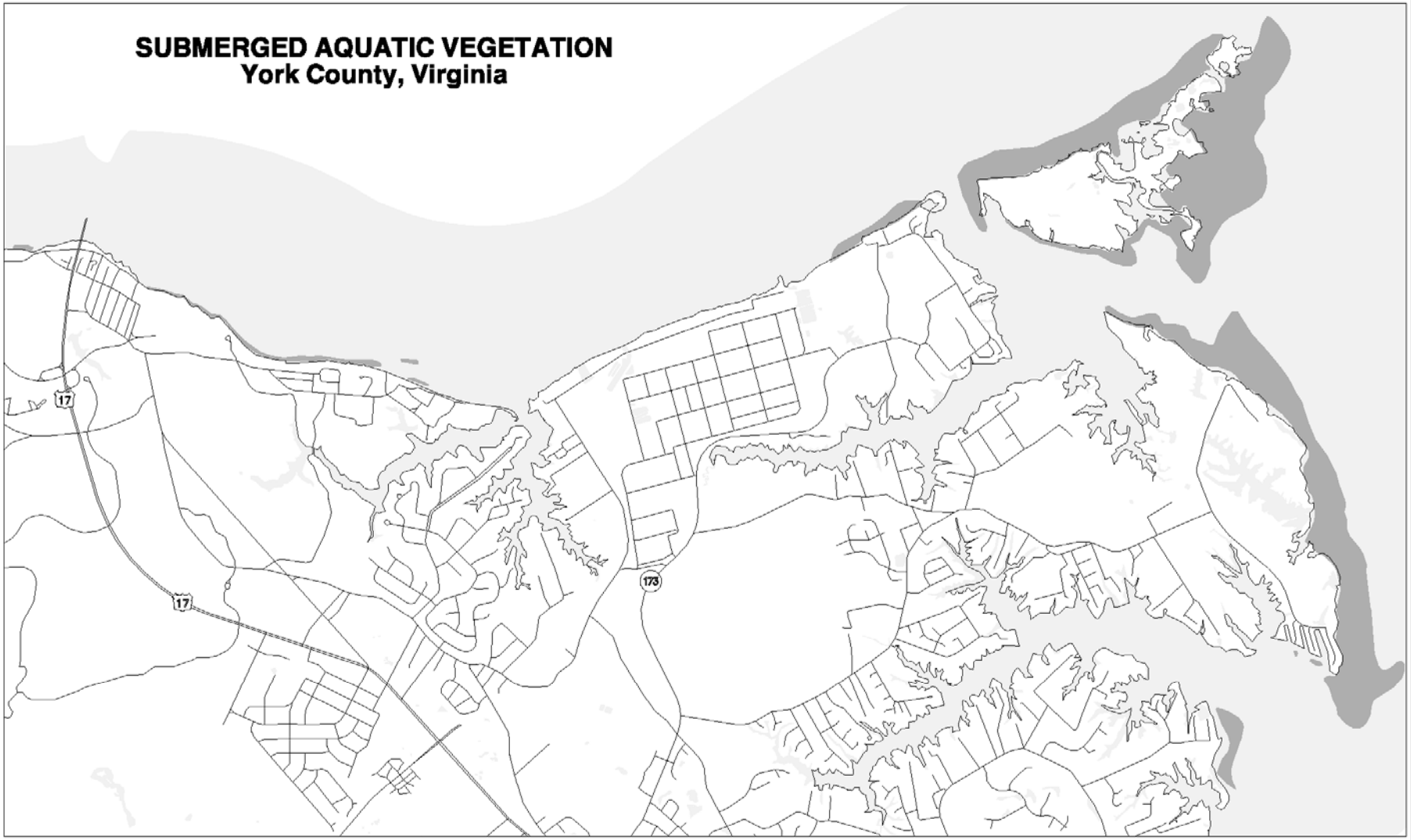
These facilities meet or exceed federal guidelines established under the Clean Water Act.

In 1987 the Clean Water Act was amended to include non-point sources (i.e., pollution from an indirect source such as stormwater runoff). According to the State Water Control Board, non-point source pollution in the lower York River basin comes from several sources, including "residential, urban, and/or agricultural runoff, failing/inadequate septic systems, natural conditions and drainage and boat pollution from the surrounding public and private boat slips." The loss of protective vegetation and the increase in impervious surfaces (buildings, roads, and parking lots) increases the amount of stormwater runoff and also the levels of pollution and nutrients. In addition to sediment and nutrients, toxins are discharged, adding to the overall stress on the finfish and shellfish population.

The EPA enacted the he National Pollution Discharge Elimination System (NPDES) Phase II program in 1999. York County must submit a stormwater discharge permit for compliance with this program by the year 2003. The purpose of these regulations is to address non-point source discharges such as storm water that is a major contributor to the sediment and nutrient loadings in estuaries, rivers and the Chesapeake Bay. The NPDES Phase II program requires a stormwater management system that meets the following six minimum control measures:

- Public education

SUBMERGED AQUATIC VEGETATION
York County, Virginia



Submerged Aquatic Vegetation

Provided by the Virginia
Institute of Marine Science

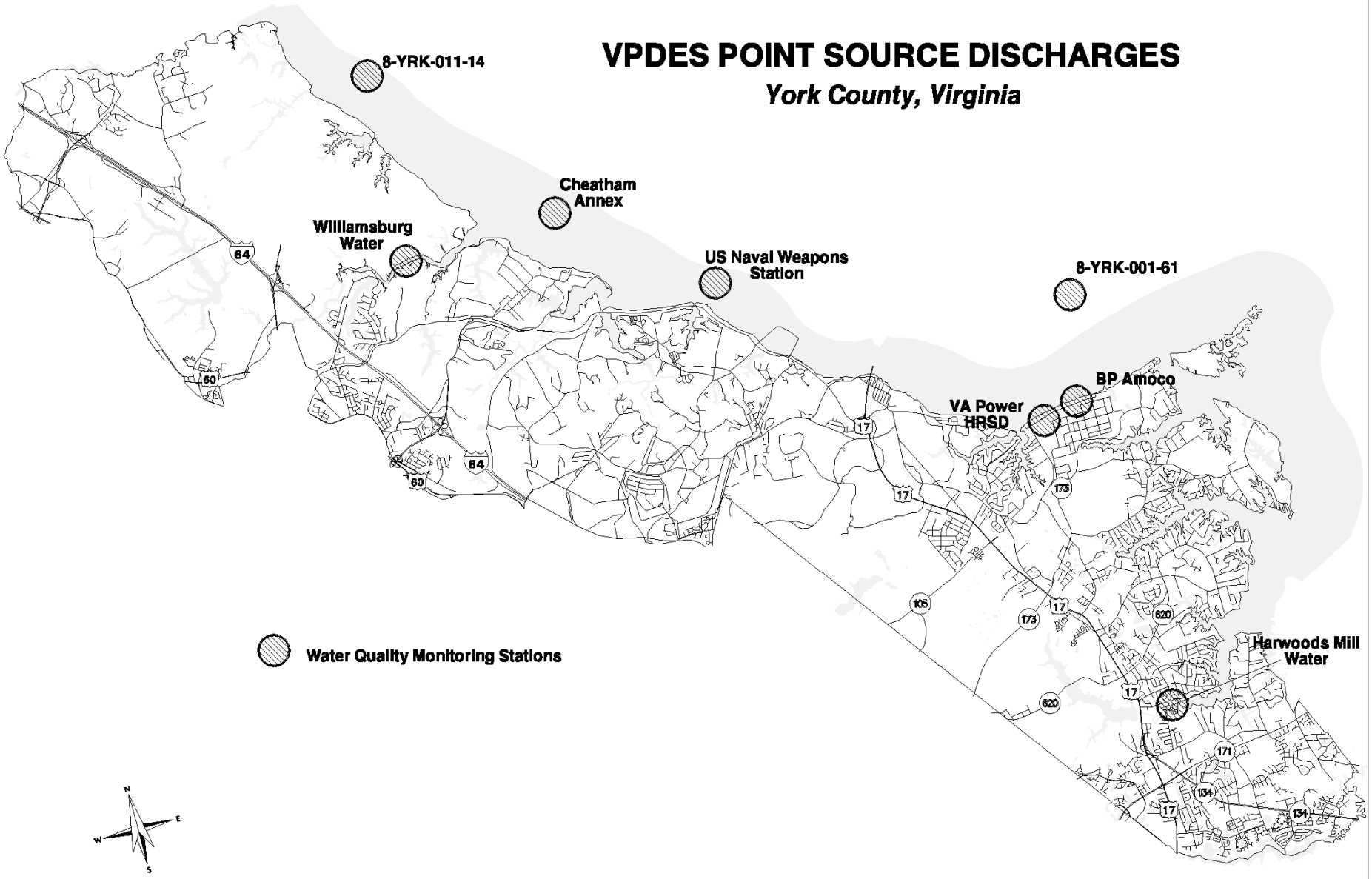
N E S W

March 06, 2001

Prepared by York County
Computer Support Services

VPDES POINT SOURCE DISCHARGES

York County, Virginia



May 15, 2001

Prepared by York County
Computer Support Services

- Public involvement/participation
- Illicit discharge detection and elimination
- Construction site controls
- Post construction controls
- Pollution prevention/good housekeeping for municipal operations

Non-point source pollution from fertilized lawns and impervious areas are addressed by the Chesapeake Bay Preservation Act through the 100-foot buffer area requirement and water quality measures. In addition, non-point source pollution from failing septic systems is being reduced through the County's Utilities Strategic Capital Plan to bring public sanitary sewer to developed areas. Furthermore, the Health Department's recent adoption of stringent separation requirements between groundwater and drainfields will also help lower the bacteria counts and improve water quality. Alternative on-site sewage disposal systems approved by the Health Department and permitted by the revised Chesapeake Bay regulations may also replace failing septic systems.

Chesapeake Bay Presevation Act

To counteract the widespread degradation of the Chesapeake Bay, the Virginia General Assembly enacted the Chesapeake Bay Preservation Act in 1988. The general purpose of the Act is to require that land be managed in a manner that reduces pollutants entering the Bay by 40% by the year 2000. Local governments are required to implement the Chesapeake Bay Preservation Act provisions since the regulation of land use and development has traditionally been a function of local government. York County incorporated the regulations into its Zoning Ordinance in September 1990. In so doing, the Board of Supervisors designated certain areas of the County as Chesapeake Bay Preservation Areas, which include a Resource Protection Area (RPA), Resource Management Area (RMA), and IDA (Intensely Developed Area). The RPA includes tidal wetlands, non-tidal wetlands, and tidal shores; these areas must maintain a 100-foot vegetated buffer adjacent to and landward of the areas named and on both sides of a tributary stream. The RMA abuts the RPA and includes floodplains, highly erodible soils, non-tidal wetlands not included in the RPA, and those lands necessary to minimize erosion. The IDA encompasses areas with a significant amount of impervious surface. This classification warrants utilizing these already built areas to their highest and best use prior to converting undeveloped property.

The Chesapeake Bay Preservation Areas are within the County's Environmental Management Area (EMA) Overlay District as set forth in the Zoning Ordinance. Special development standards applicable to these areas are designed to accomplish the following goals:

- Preserving vegetation
- Minimizing land disturbance
- Minimizing impervious cover
- Controlling stormwater runoff
- Pumping out septic tanks
- Providing a reserve drainfield

In addition, to further protect the estuaries and the Bay, new waterfront developments are encouraged to provide a community pier rather than lots with individual piers.
Unfortunately, the 40% pollutant reduction goal was not met by the year 2000, and the Tributary Strategies program was initiated in 1995 to further address this goal. Each tributary or watershed will have a strategy developed by the State to address methods to reach that goal. York County drains to three different tributaries; the York River, the James River, and the Coastal area of the Chesapeake Bay.

On June 28, 2000, the Chesapeake Bay Program adopted a new Bay agreement, Chesapeake 2000: A Watershed Partnership, that will guide the next decade of restoration in the Bay watershed. Signed by the governors of Virginia, Maryland, and Pennsylvania; the Mayor of Washington, D.C.; the U.S. EPA Administrator; and the Cheseapeake Bay Commission; this agreement rededicates efforts to the restoration and protection of the Chesapeake Bay system. The Agreement sets the following six goals to guide the restoration effort over the next ten years:

1. Living Resources Protection and Restoration
2. Vital Habitat Protection and Restoration
3. Water Quality Restoration & Protection
4. Sound Land Use
5. Stewardship and Community Engagement

York County has several initiatives currently underway that meet the goals of the Chesapeake 2000 agreement and will continue to pursue the goals as funding opportunities are made available.

Docks and Piers

As of 1993, there were approximately 670 private docks and piers in the County, most of them in the lower County along protected creeks and coves. High pier densities are found along Chisman Creek and sections of the Poquoson River. Potential environmental impacts of small private piers include shading, displacement of aquatic life, increased turbidity, temporary impacts from construction, and impacts relating to motorized boat use. While the individual impacts from a single dock may be relatively small, the cumulative impacts of docks and piers can be significant. For these reasons, it is preferable to have community piers serving multiple users than for each individual waterfront property owner to have his or her own private dock.

The regulation of piers has traditionally been viewed as the jurisdiction of the state. Local governments have been reluctant to regulate private piers because the state enabling authority to do so is unclear. However, local governments can manage pier density through the zoning and subdivision ordinances by clustering development away from shorelines and retaining waterfront common open space with a community pier. In York County, community piers could be encouraged for all new waterfront open space (cluster) subdivisions. Deed restrictions recorded prior to final plat recordation, can be used to prohibit individual lot owners within such a development from having an individual pier. A second way in which local governments can control pier density is through the minimum lot size and width requirements for waterfront lots. In addition, the County can work with state permitting agencies to educate waterfront property owners about pier design techniques that will minimize environmental impacts. For example, the height of a pier above the water has been found to be the most significant factor in dock design affecting the health of submerged aquatic vegetation. Ideally, a pier should be at least nine feet (9') above the submerged bottom, should have a north-south orientation, and should be no wider than three feet (3'). Also the use of alternative building materials, such as recycled PVC, is recommended over chemically-treated wood.

One of the initiatives of the Chesapeake Agreement 2000 is to increase public access points to the waters of the Chesapeake Bay and its tributaries by 30% by the year 2010. Currently York County has seven public boat ramps, all of them in the lower County, and approximately thirteen commercial/private marinas. The Colonial National Historical Park, which is open to the public, provides a huge park setting for passive recreational opportunities and wildlife habitat. Additional public access sites are increasingly difficult to find, but the County will continue to pursue the acquisition of available surplus government and private lands. Opportunities may exist for acquisition of an additional park site along Back Creek as well as Ringfield Park, currently owned by the National Park Service, which would provide a much needed access point west of the Coleman Bridge.

The environmental impacts of additional access should be considered in the siting and design of any new facilities. Future public access points, both public and private, must be sited and developed in accordance with guidelines issued by the VMRC. The Hampton Roads Planning District Commission has also published guidelines for the siting of boat ramps, marinas, canoe/kayak put-ins, and fishing and pedestrian shoreline access facilities, which are contained in a 1997 report titled Regional Shoreline Element of the Comprehensive Plan. Additional siting guidelines for boating access, beach and swimming, access pier and bank fishing, and natural area access are contained in the Chesapeake Bay Program's Chesapeake Bay Area Public Access Technical Assistance Report.

The County is also pursuing improved public access to the water through the Yorktown Revitalization project, including the Riverwalk (a pedestrian facility along Yorktown Beach) and replacement of a public wharf and pier with a new deep-water pier. The new pier will accommodate deeper draft and large

vessels, such as tall ships and dinner cruise boats, without dredging. Facilities will also be provided for the docking of small pleasure boats for day-trippers, and an observation deck for pedestrians is proposed. The revitalization project also includes beach stabilization and nourishment as well as the retrofitting of stormwater facilities to reduce pollutant-loading from the contributing upstream development.

Wetlands

Wetlands are commonly associated with swamps and marshes. Although most often considered to be located in tidal areas, they are also found along the floodplain, in waterways of various types, and in sheltered areas along inter-tidal coasts. Non-tidal wetlands can occur wherever there is, for at least a portion of the growing season, sufficient water to support hydrophytic plants and hydric soils. York County recognizes that wetlands are a unique and important ecosystem performing valuable functions. Specifically, wetlands store and infiltrate floodwaters, provide wildlife habitat and food sources, filter pollutants and sediment from upland runoff, and naturally control shoreline and stream bank erosion.

The management of tidal and non-tidal wetlands in York County involves federal, state and local regulatory entities. A Joint Permit Application (JPA) must be submitted for any work occurring in a wetland area. The application is submitted to the Virginia Marine Resources Commission (VMRC) for distribution to the York County staff and Wetlands Board, the Virginia Department of Environmental Quality (DEQ), and the U.S. Army Corps of Engineers.

Tidal and non-tidal wetlands in York County are shown on the Wetlands Map in the Environment element of this plan. The Goodwin Islands, with approximately 820 acres, comprise the County's largest tidal wetland community. They are owned by the College of William and Mary and are managed as a Natural Estuarine Research Reserve. The Grafton Ponds are non-tidal isolated freshwater wetlands located mostly on property owned by the City of Newport News, which manages the area as a part of its water supply network. Many of the County's wetlands are considered to be unique environmental features and are described by the Virginia Department of Conservation and Recreation in the Natural Areas Inventory of the Lower Peninsula of Virginia. Most of these areas, with the exception of Queen Creek, are in the lower County. Not only protected by state and federal agencies, these areas are protected by the provisions in the County's Environmental Management Area Overlay District. As such, they are subject to special performance standards and afforded the same water quality protection as Chesapeake Bay Preservation Areas.

The Army Corps of Engineers has the authority to regulate activities that occur in tidal and non-tidal wetlands adjacent to waters of the U.S. through the Clean Water Act. "Waters of the U.S." are defined under the "Final Rule for Regulatory Programs for the Corps of Engineers," 33 CFR Part 328. The Department of Environmental Quality is currently developing Draft Regulations to implement the Virginia Nontidal Wetlands Act of 2000. The goal of the Virginia regulatory program is to achieve "no net loss" of wetlands acreage and function. Furthermore, in order to ensure that non-tidal wetlands regulations are enforced, the Zoning and Subdivision Ordinances require notification of regulatory agencies if wetlands exist or are thought to exist on the site.

The York County Wetlands Board has jurisdiction over tidal wetlands and enforces the County's Wetlands Ordinance. Requests for bulkheads, riprap, and beach nourishment are typical of the applications reviewed and issued by the Wetlands Board. The Wetlands Board's jurisdiction ranges from mean low water to 1.5 times the tidal range in vegetated wetlands and from mean low to mean high water in non-vegetated wetlands.

It is the County's goal to protect shoreline property in a cost-effective manner that also preserves and enhances shoreline resources, water quality, wetlands, and wildlife habitat. The Wetlands Board works toward this goal by strongly encouraging applicants to obtain assistance from the Shoreline Erosion Advisory Service, the Virginia Institute of Marine Science, the Virginia Marine Resources Commission, and County staff for shoreline erosion control projects. When shoreline erosion is severe and threatens structures , the Wetlands Board will consider structural shoreline stabilization methods located in wetlands of lesser ecological value. When shoreline erosion is slight to moderate, the Board encourages property owners to implement non-structural measures such as re-grading and re-vegetating. The Wetlands Board encourages coordination of shoreline erosion control projects among properties through

mandatory notification of all adjacent property owners and posting of "Wetlands Permit Pending" signs and special Group Wetlands Permit. On properties with adequate separation between development and the shoreline, the Wetlands Board favors riprap revetments over bulkheads. Maximizing the vegetated buffer in accordance with the provisions of the Chesapeake Bay Preservation Act reduces the need for structural controls, which must be considered only a temporary correction for erosion problems. The goal should be to direct future development and redevelopment away from severely eroding shorelines to areas that can be developed without any adverse impacts on water quality.

The Wetlands Guidelines (VMRC 1993) describes the tidal and non-tidal wetlands communities that exist along the County's shoreline and classifies them into seventeen community types. The communities are then ranked relative to one another and categorized into five groups for environmental value. Group One communities, for example, merit the highest order of protection because they are most closely associated with fish spawning and habitat, whereas Group Five marshes have only a few values of significance. York County fully recognizes the intrinsic value of all seventeen wetlands community types. When shoreline erosion control issues are being considered, the ranking system can be used as a tool in making decisions. For example, the Wetlands Board, using the Grouping System, would disapprove placement in a *Spartina Patens* (Group One) marsh if it could be moved landward to a *Phragmitis* Community (Group Five). Erosion control structures should not be permitted in Group One wetlands if there is any alternative.

The Virginia Wetlands Program Technical Report 99-2 contains the results of a study estimating the impacts of permitted shoreline erosion control structures on vegetated and non-vegetated tidal wetlands. Between 1988 and 1992, approximately 0.43 acre of vegetated wetlands and 1.5 acres of non-vegetated wetlands were impacted by newly permitted shoreline structures.

Shoreline and Streambank Erosion

York County's shoreline consists of sheltered fine sand beaches, coarse sand beaches, exposed tidal flats, sheltered tidal flats, fringing intertidal marshes, supratidal marshes partially protected by elevation, and freshwater marshes and swamps. There are approximately 2,308 acres of marshes in the County.

Shoreline erosion is a naturally occurring process whereby forces, such as storms and the movement of the tides, cause the boundary between land and water to recede and move inland. Erosion can contribute to the sedimentation and pollution of streams, rivers, and the Chesapeake Bay, resulting in the loss of wildlife habitat and reduced water quality and, when severe, threatening property. The increased rate and volume of stormwater runoff associated with development can accelerate the natural process of erosion.

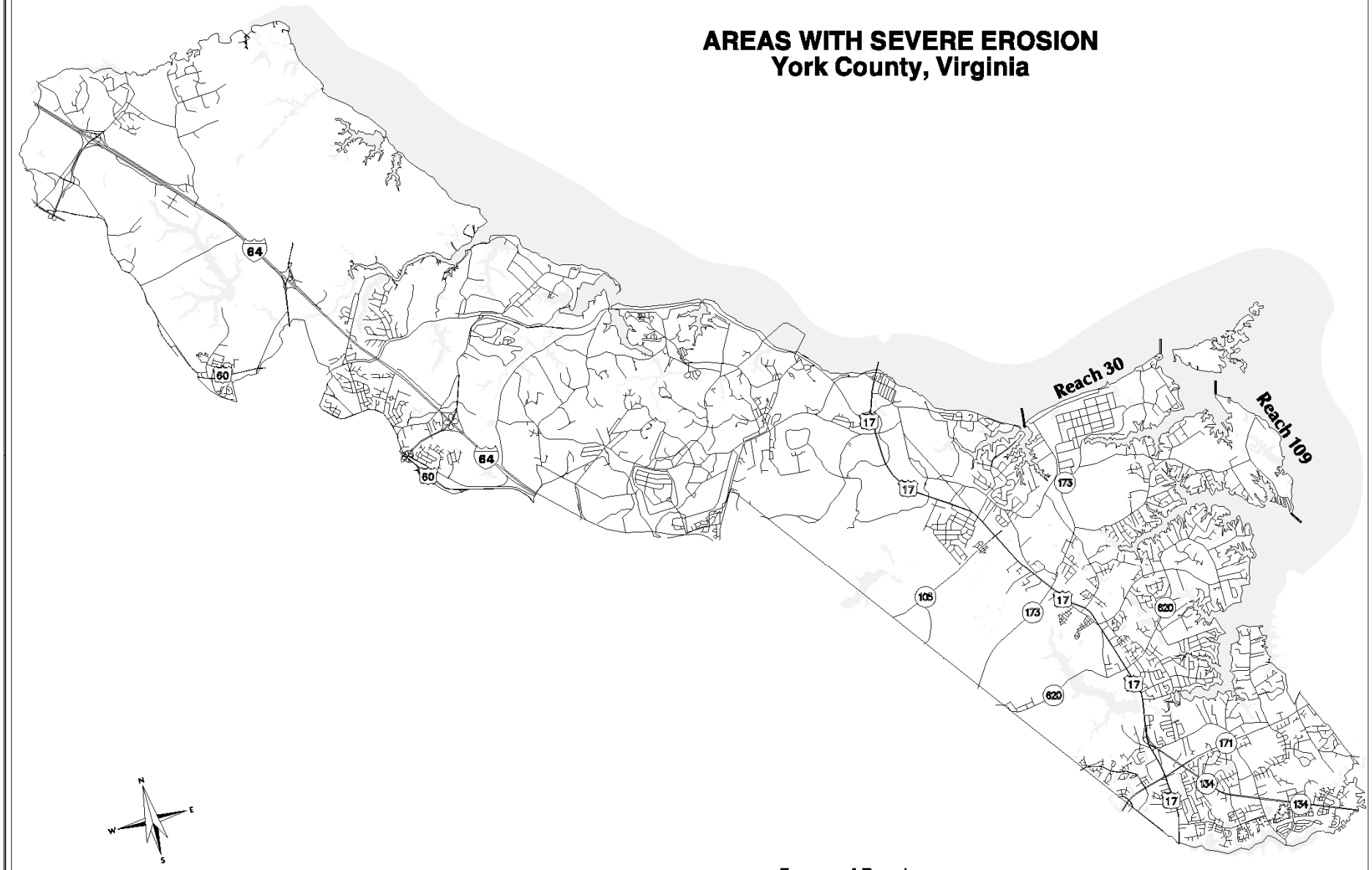
York County encompasses approximately 207 miles of shoreline. The upper County drains via a system of streams and rivers to the southern reach of the York River. This area is characterized by rolling terrain with well-drained soils and elevations up to 100 feet above Mean Sea Level. In isolated areas, moderate to severe erosion has been noted in the VIMS Shoreline Situation Report (1999). The lower County drains via a system of creeks and rivers to the Chesapeake Bay. This section of shoreline includes Back Creek, Chisman Creek, a portion of the Poquoson River, and the western shore of the Chesapeake Bay. Low flat lands with a relatively high water table characterize the topography of the lower County.

Erosion rates are a concise tool to measure the impacts of natural and human effects on the shoreline. They are used to determine appropriate strategies for future development and to determine the most appropriate method to address erosion. The Chesapeake Bay Local Assistance Department suggests classifying eroding shorelines into one of three categories:

1. Slight – less than one foot per year
2. Moderate – one to three feet per year
3. Severe – more than three feet per year

In York County, the western shore of the Chesapeake Bay presents a unique challenge. The two areas with severe erosion are Reach 109 (the Bay Tree Beach area) and Reach 30 (the Sandbox area west of the entrance to the Thorofare). These areas historically experience moderate to severe erosion rates of up to 3.5 feet per year. Although there is residential and industrial (BP Amoco – Reach 30) development along both of these shorelines, the erosion does not appear to be associated with the development. Most of the

AREAS WITH SEVERE EROSION
York County, Virginia



— — Extent of Reach

March 07, 2001

Prepared by York County
Computer Support Services

homes were built more than ten years ago and are set back from the shoreline, although some homes along Dandy View Lane and Waterview Road are endangered. The erosion is due in large part to wave action associated with the physical alignment of the shore and prevailing storms. The Wetlands Board has approved several permits along Reach 30 for riprap, breakwaters, and marsh toe stabilization structures. The Bay Tree Beach area is much less developed than the Sandbox area. Most of these properties are not developed because the soils and the high water table preclude on-site sewage disposal systems.

Along the York River the rate of erosion is slight to moderate, but the shoreline at the mouth of the river is vulnerable to the high-energy waves generated by the dominant northeast storms. The Yorktown historic area and recreational beach is along this shoreline. There is an ongoing project to stabilize the beach with a combination of methods, including riprap, breakwaters, beach nourishment, and vegetation.

The type of erosion control structure needed in a given situation is guided in part by the rate of erosion. Revegetation and re-grading are the preferred methods of non-structural erosion control in areas of slight erosion. Bulkheads and riprap are considered when the property is small and the distance between development and the shoreline precludes re-grading. Riprap revetments are typically encouraged over bulkheads as they are more effective at dissipating wave energy, have a longer life, and provide habitat for marine organisms. Evidence of a trend to use riprap rather than bulkheads is noted in the table below.

SUMMARY OF CHANGES IN SHORELINE CONDITIONS FOR YORK COUNTY	
Shoreline Attribute	Change, 1985-1993 (+/-Linear Meters)
Riprap revetment	+659
Bulkhead	-252
Groin field	+176
Breakwater	+619
Groin field bulkhead	+99
Groin field/riprap	+193
Bulkhead/.riprap	-241
Miscellaneous structure	-285
No structures/stable shore	+63
No structures/unstable shore	-150
Source: Shoreline Situation Report, Virginia Institute of Marine Science, 1999	

The amount of bulkhead and bulkhead in conjunction with riprap decreased in York County by approximately 1,620 linear feet and the amount of riprap increased by 2,160 linear feet between 1985 and 1993. Miscellaneous structures and the amount of unstable shoreline also declined. These trends provide positive evidence that environmentally sound shoreline erosion techniques are being implemented.

The Hampton Roads Planning District Commission's Regional Shoreline Element of Comprehensive Plans provides as a general guideline the following ranking of various shoreline erosion control alternatives for different wave climates:

Areas with a Low Erosion Rate (< 1 foot/year)	Areas with a Moderate Erosion Rate (1-3 feet/year)	Areas with a Severe Erosion Rate (>3 feet/year)
1. Vegetative stabilization with/or bank regrading	1. Vegetative stabilization with/or bank regrading	1. Relocation
2. Revetment	2. Beach nourishment	2. Beach nourishment
3. Bulkhead	3. Revetment	3. Revetment
	4. Breakwaters	4. Breakwaters
	5. Groins	5. Groins
	6. Bulkhead	6. Seawall

Although these shoreline erosion control strategies are ranked individually, it is likely that a combination of measures is necessary depending on unique site-specific conditions. This ranking is consistent with the Chesapeake Bay Preservation Act and Virginia Wetlands Guidelines.

In addition to the shoreline areas previously noted, there are streams and ditches in the County showing evidence of deterioration and erosion. Some of the streambank erosion is due to natural causes; however,

some is due to upstream development and conventional ditch maintenance. Many of these streams have been identified in the County's Utilities Strategic Capital Plan for restoration In 2000 the Board of Supervisors formed a Drainage Advisory Committee whose purpose is to assist County staff in identifying erosion, flooding, and drainage problems and prioritizing areas for improvements. The Drainage Committee joins County staff with the citizens in a collaborative effort, thus providing a forum for public involvement and participation. The Marlbank Ravine Restoration Project is currently underway utilizing a combination of options, including bioengineering, regrading, revegetating, and, where necessary, piping. The County is also beginning the design of a Wetlands Interpretive Center and Stream Restoration project in the Lackey area. The Lackey project promotes community involvement by partnering with the Boy Scouts and Master Gardeners and Tree Stewards.

Stream bank erosion, like shoreline erosion, is a natural process, with many of the same negative impacts. Natural factors that contribute to stream bank erosion, are steep slopes and highly erodible soils. Development on steep slopes greater than 15% is regulated through the Zoning and Subdivision Ordinances to ensure the integrity of slopes and waterways.

Stream bank erosion is more often directly related to land use and development than is shoreline erosion. York County limits stormwater runoff from developed sites to pre-development rates through the strict application of the Erosion and Sediment Control regulations, which require that properties and waterways downstream of development be protected from sediment deposition, erosion, and damage caused by increases of volume, velocity, and peak flow rates of stormwater runoff for certain storm events. Inevitably, however, the volume and duration of stormwater runoff are increased with increased amounts of impervious area. Pursuant to the Erosion and Sediment Control Ordinance, the County requests calculations proving downstream adequacy. When possible, stream banks will be restored to a natural state using bioengineering options with contiguous floodways. Piping will be used as a measure of last resort. In this manner, stormwater management, erosion control, non-point source pollutant, and habitat creation goals will be achieved. The reduction and minimization of impervious surfaces is a major issue, especially with regard to streambank erosion. Low-Impact Development and conservation design, as methods of retaining pre-development site hydrology, are extremely valuable tools that will reduce streambank erosion and protect water quality. Based on this information, shoreline and streambank erosion are significant issues for York County. The Wetlands Board is doing an admirable job of preventing shoreline erosion while limiting hardening of the County's tidal shoreline. The County has begun a streambank restoration project at Charles Brown Park in Lackey which will serve as a pilot program for bioengineering techniques. In addition, the Drainage Advisory Committee and the County's Department of Environmental and Development Services are reviewing erosion and flooding problems to prioritize streambanks not addressed in the Capital Plan. The trend in the County is to favor streambank restoration and bioengineering over the conventional piping and bank hardening solutions.

Flood Zones

York County is in a tidal area with some areas in low and relatively flat terrain. Coastal flooding is a potential hazard, affecting approximately 7,000 acres of land close to coastal streams and creeks. The flat topography of the Seaford and Dandy areas results in flooding during major storms. Through the National Flood Insurance Program (NFIP), property owners can obtain flood insurance through the private insurance industry at a reasonable cost. Communities participating in the NFIP, such as York County, have established plans and adopted regulations to lessen potential losses from flood damage. Regulations must be consistent with the NFIP. These regulations apply to those portions of a locality which are within the 100-year floodplain, which includes those areas subject to inundation by the 100-Year Flood (i.e., a flood level with at least a 1% chance of being equaled or exceeded in any year). The Flood Insurance Rate Map shows those areas of the County identified by the Federal Emergency Management Agency (FEMA) as being located in a flood hazard area. It is broken down into flood zone areas based on degree of risk.

Communities participating in the NFIP require newly constructed and substantially improved residential structures in the special flood hazard areas to have the lowest floor elevated above "the base flood level." Non-residential structures must either elevate the lowest floor or design the structure to be watertight. In an effort to reduce losses even further, FEMA has recently developed a voluntary program known as the "Community Rating System" by which communities can augment their existing floodplain protection

programs in ways that may reduce loss-payouts should a flood event occur. In return for implementing this, the Federal Insurance Administrator can grant small general reductions in premium rates within the community.

WASTE MANAGEMENT

Over the past six years York County's waste management program has changed dramatically in both concept and approach. During this period the following changes have been implemented:

- A roadside trash pickup program has been initiated for all single-family detached homes through a contract with a private waste operator; the County maintains operational oversight of the program.
- The operating landfill has been closed in conformity with federal and state standards.
- A waste transfer station was constructed by the County and is leased to a private operator to receive and transfer waste to over the-road-vehicles for transfer to federally and state approved disposal sites outside of York County. This station receives wastes from the County's roadside collection program as well as drop-off wastes by both citizens and commercial users. Citizens participating in the curbside program dispose waste at no cost while all others pay for this service. The operator of the station may also use the station to handle non-program waste collected by its vehicles for the payment of a tonnage fee.
- A long-term contract was entered into with a private waste contractor to dispose of all waste collected by the County at one of several sites approved by the County.
- The County entered into a partnership with the Cities of Hampton and Poquoson to operate a 25,000-ton/year yard waste facility under the direction of the Virginia Peninsulas Public Service Authority (VPPSA). This facility processes leaves, grass, and woody waste into mulch and compost which is sold or is available without additional cost to the participating jurisdictions.
- The County began providing heavy yard waste pickup for a modest fee.
- The County has expanded its drop-off recycling program to include waste oil, antifreeze, batteries, paper and tires.
- A new recycling contract was negotiated which included the handling of mixed paper for the first time. Since the addition of mixed paper, the tonnage of household material recycled has increased and the per household tonnage of landfill disposed waste has decreased.
- In 1997 the County initiated a household chemical waste collection program operated by VPPSA, which includes most of the wastes that cannot be disposed of in landfills. As an adjunct to this program, advice is made available on how properly to dispose of waste that cannot be handled under this program.
- The Board of Supervisors approved a roadside leaf pickup program, which was initiated during the 1997-98 leaf season. Despite some initial concerns the program was successful and the amount of leaves delivered to the Compost Facility doubled during Fiscal Year 1997-98.
- During 1998 the County was a leader in working with the Virginia Department of Environmental Quality (DEQ) through VPPSA to establish a waste tire amnesty program. Through July 1998, 5,000 tires were processed from York County alone. While this is a grant program it is hoped that its success will encourage DEQ to continue its funding in the future.
- The County has joined the Environmental Protection Agency's Wa$teWi$e program to foster the use of products made from recycled materials.
- Since May of 1997, York County has participated in the Collection of Household Chemicals Program. The program provides residents the opportunity to dispose of a variety of chemicals in an environmentally safe manner. The chemicals accepted include paints, gasoline, brake fluid, pesticides, drain cleaners, etc. which might otherwise be disposed of via the storm drainage system or dumped on the ground to possibly contaminate groundwater. The Collection Program is available every other month at three locations serving five communities. Since its inception, more than 100,000 pounds of chemicals have been collected and disposed of and over 2,300 York County residents have participated in the program.

York County has continued to market its recycling program in educational, household and the commercial/industrial sectors, and the success of these programs is demonstrated by the fact that in 1997 York County homes and businesses diverted approximately 42% of their municipal solid waste (including aluminum and other metals, auto bodies, newspaper, office paper, corrugated cardboard, plastic, glass,

leaves and yard debris, and motor oil) from the County's waste stream, well above the State-mandated goal of 25% by 1993. When adjusted to include supplemental recycling materials – primarily coal ash bus also tires, batteries, anti-freeze, etc. – the recycling rate rises to 78%. Contracting waste services out while maintaining operational control has resulted in savings to County citizens while significantly improving the environment. A good example of this is that before the County took over responsibility for the roadside trash pickup there where often waste containers on the street three or four days a week. In most of the County the containers are out only one day per week.

NOISE

Though not generally acknowledged as a form of environmental pollution, noise has become a growing concern with the addition of new highways and increasing air and automotive traffic. In 1972, congress passed the Noise Control Act to establish noise emissions standards for new products. The EPA coordinates federal noise research programs and determines whether noise emission standards protect the public health. Although state and local governments do not set standards, noise can be controlled through local regulations and licensing requirements. York County currently regulates noise in public areas and excessive noise from radios, horns, animals, vehicles, and performances.

Aircraft operations at Newport News/Williamsburg International Airport and Langley Air Force Base are the principal sources of objectionable noise in the County. Noise contours indicate the levels of aircraft noise in areas close to airport runways and are based on the average day-night sound level (abbreviated as DNL and symbolized mathematically as Ldn) observed in these areas. Ldn is the accepted unit for determining the extent of compatibility of noise-generating activities with different types of development. For residential development, according to the Department of Housing and Urban Development, an Ldn greater than 65 is considered to represent unacceptable level of noise exposure. Most of the land surrounding the airport in York County is undeveloped; however, some residential areas – including Meadowview Drive, Carraway Terrace, and areas of Lakeside Forest, Harwood Heights, Burts Road and Oriana Road – are within the 65 noise contour, and parts of the Kentucky Farms subdivision are within the 70 noise contour. These noise contours are likely to shrink, however, as older, louder jet engines are phased out and replaced as mandated by the Federal Aviation Administration. Moreover, according to the Airport Master Plan adopted in May 1997, planned runway extensions will actually reduce noise exposure because of the shift in the aircraft mix from the louder military aircraft to the quieter commercial jets.

The noise contours for Langley Air Force Base indicate that the only residentially developed property in the County where the base's aircraft operations generate unacceptable noise levels (i.e., 65 Ldn) is in Bethel Manor, which is Langley Air Force Base housing.